

1969

**OPERATING
SUMMARY**

GEORGETOWN

water pollution control plant

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WATER
COMMISSION

ONTARIO WATER RESOURCES COMMISSION

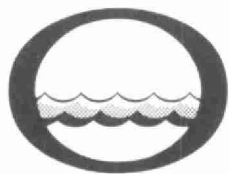
Division of Plant Operations

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Water management in Ontario

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Commission


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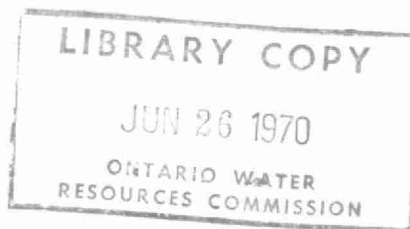
The operating efficiency and financial status of the water pollution control facilities operated for you in 1969 are presented in the following pages.

The regional operations engineer's comments and the statistical data will assist you in gauging the plant's level of performance. A new flow chart and up-to-date design data are also provided.

Various divisions and sections within the Commission have co-operated in providing what we trust is an accurate and concise annual operating summary.


D.S. Caverly,
General Manager.


D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.



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GEORGETOWN
water pollution control plant

operated for

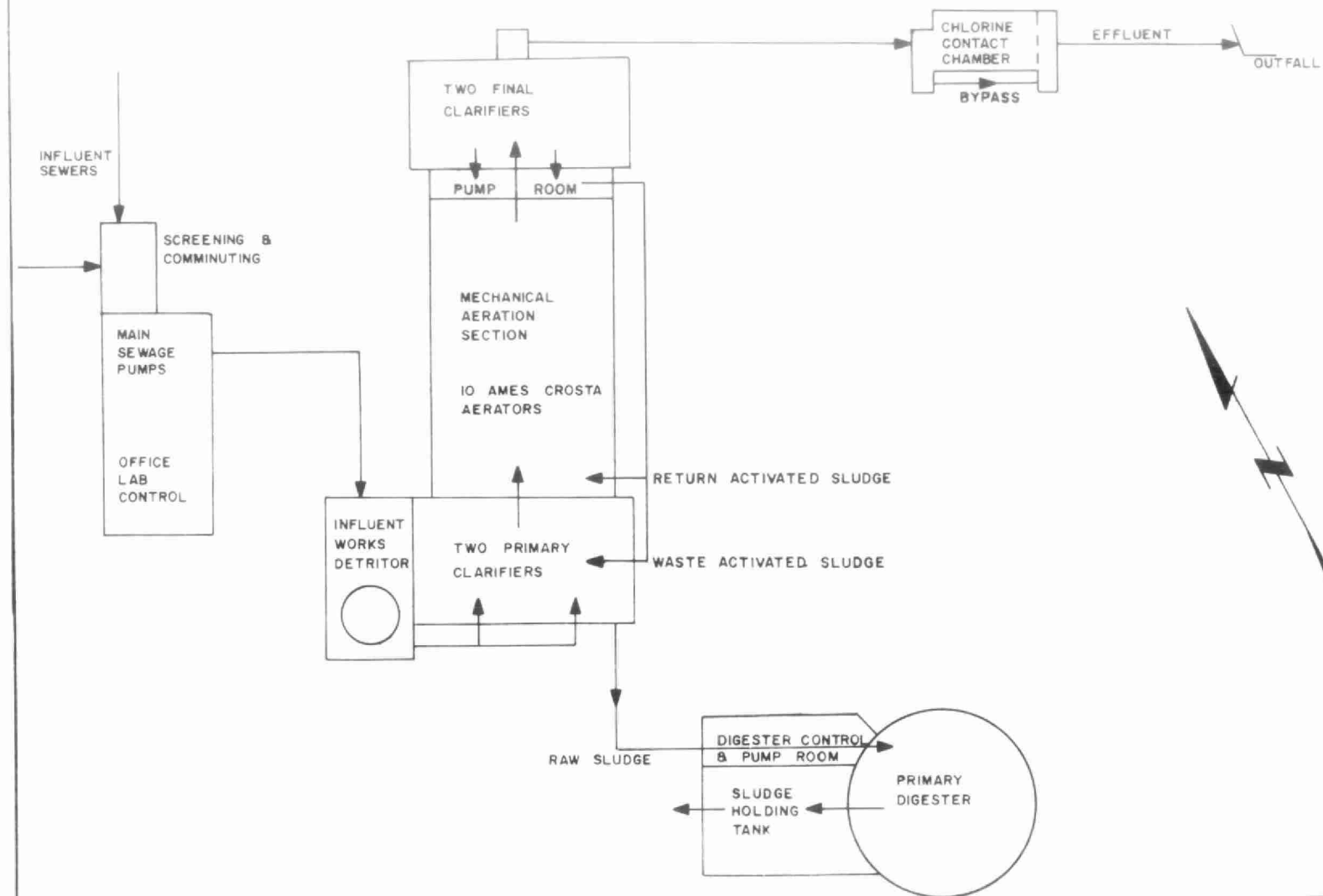
THE TOWN OF GEORGETOWN

by the

ONTARIO WATER RESOURCES COMMISSION

1969 ANNUAL OPERATING SUMMARY

GEORGETOWN WPCP
FLOW DIAGRAM



DESIGN DATA

PROJECT NO.	2-0017-58	TREATMENT	Activated Sludge
DESIGN FLOW	1.50 mgd	DESIGN POPULATION	15,000
BOD - Raw Sewage - Removal	200 mg/l 95%	SS - Raw Sewage - Removal	200 mg/l 95%

PRIMARY TREATMENT

Screening

Type: Manually cleaned bar screen
Size: 3/4" spacing

Comminution

Type: C. P. Barminutor
Size: One Model C (24")

Sewage Lift Pumps

Type: Chicago Pump
Size: Two 2,900 gpm @ 60' tdh

Grit Removal

Type: Dorr Type WA Detritor
Size: One 12' x 12' x 1' 3" (1,120 gal)
Retention: 1.1 min

Primary Sedimentation

Type: Dorr Type A
Size: Two 35' x 35' x 10' swd
(24,500 cu ft or 153,000 gal)
Retention: 2.5 hours
Loading: Surface, 612 gal/ft²/day
Weir, 5,360 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Mechanical aeration; single-pass
Size: Two 112' x 28' x 13.25' (79,400 cu ft or 0.495 mil gal)
Retention: 7.9 hours

Aerators

- Eight Ames-Crosta

Secondary Sedimentation

Type: Dorr Type AZ
Size: Two 40' x 40' x 10' swd (32,000 cu ft or 200,000 gal)
Retention: 3.2 hours
Loading: Surface, 470 gal/ft²/day
Weir, 4,700 gal/ft/day

CHLORINATION

- One W & T 200 lb/day

Chlorine Contact Chamber

Size: One 45' x 15' x 6' deep (27,000 gal)
Retention: 26 min

OUTFALL

- to Silver Creek

SLUDGE HANDLING

Digestion System

Type: Two-stage

Primary --

Type: Dorr draft tube mixers (3) on fixed steel roof
Size: One 66' dia x 22.6' (avg) (77,800 cu ft or 485,000 gal)
Loading: 1.1 lb/cu ft/mo

Secondary --

Size: One 34' x 34' x 16.25' (20,700 cu ft or 129,000 gal)
Total Loading: 0.87 lb/cu ft/mo

'69 REVIEW

GENERAL

In 1969 the Georgetown water pollution control plant treated a total of 477.8 million gallons at an operating cost of \$48,582.44. The operating costs per million gallons and per lbs. of BOD removal were \$101.68 and 16 cents respectively.

Under the supervision of head office engineers the plant operated a clean, attractive and efficient plant for the City of Georgetown.

PLANT FLOW and CHLORINATION

The average daily flow was 1.32 mil. gal. representing 88% of the design daily flow of 1.5 mil. gal. per day. This marked a slight decrease from the 1968 average daily flow of 1.47 mil. gal. The average design flow of 1.5 mgd was exceeded 35% of the time during the year as compared to 6% of the time in 1968.

With an average dosage rate of 2.7 mg/l, a total of 1,074 lbs. of chlorine was required to maintain a chlorine residual of 0.5 mg/l in the final effluent.

PLANT EFFICIENCY

The average raw sewage BOD of 78 mg/l, compared with 84 mg/l in 1968, was 62% less than the design value of 200 mg/l. The raw design value was never exceeded. The average effluent BOD was 15 mg/l which is equal to the OWRC BOD objective. This objective was exceeded 27% of the time. The average BOD removal efficiency was 81%.

The average raw sewage suspended solids concentration of 137 mg/l (250 mg/l in 1968) represents 68.5% of the design value of 200 mg/l. The raw sewage design value was exceeded only 10% of the time. The average suspended solids removal efficiency was 91% resulting in an average suspended solids effluent of 12 mg/l. The OWRC effluent suspended solids objective of 15 mg/l was exceeded 22% of the time. Totals of 13 tons of BOD and 25.4 tons of suspended solids were removed in 1969.

The average raw sewage BOD and suspended solids concentrations were less than the 1968 values by 7% and 45.2% respectively. A significant decrease in raw sewage suspended solids concentration in 1969 was noted.

A continuing difference in average concentrations of BOD and suspended solids in raw sewage further emphasises a higher than normal ratio of inert to organic material. This is due to clay wastes from two paper mills.

The average primary effluent BOD and suspended solids concentrations were 58 mg/l and 89 mg/l respectively. The average MLSS concentration and F/M ratio were 1,420 and 12 respectively. Excellent treatment was again obtained at this loading throughout the year.

SLUDGE DISPOSAL

Sludge was removed from the plant grounds by tank truck directly from the primary clarifiers. Steps were taken to empty the primary digester during the year. However, the procedure was slow due to the problems caused by the heavy concentration of clay in the sludge.

CONCLUSIONS

The average final effluent BOD and suspended solids concentrations of 15 mg/l and 13 mg/l respectively indicated excellent treatment.

Plant expansion steps proceeded as far as the preparation of a preliminary report.

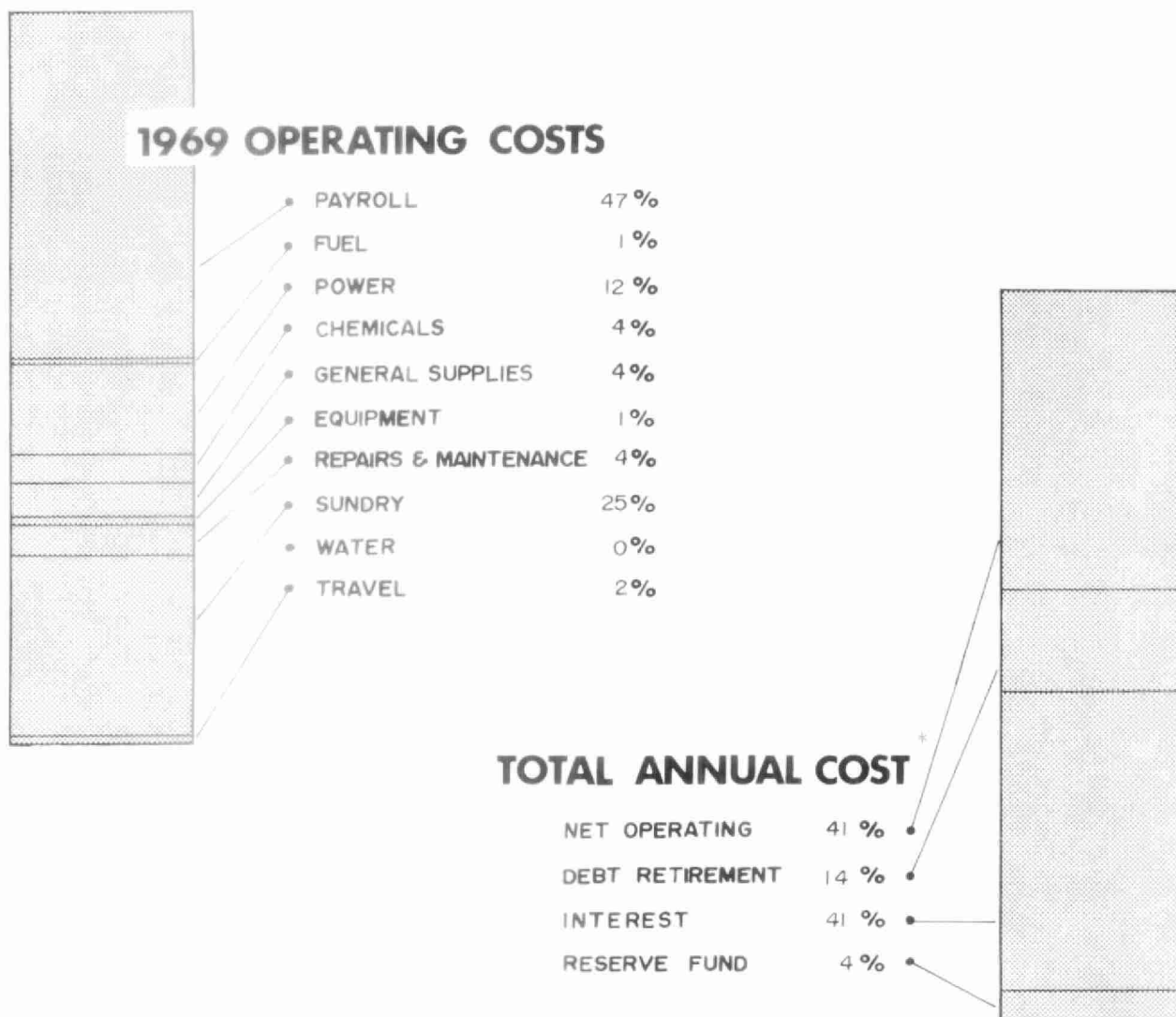
PROJECT COSTS

NET CAPITAL COST (Final)	2-0017-58	\$871,677.01	
DEDUCT payments from Municipalities		<u>48,379.33</u>	
Long Term Debt to OWRC			\$823,297.68
NET CAPITAL COST (Final)	2-0077-61	\$ 63,230.31	
DEDUCT Portion Financed by CMHC (Final)		<u>19,072.10</u>	<u>44,158.21</u>
Total Long Term Debt to OWRC			<u>\$867,455.89</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969:	2-0017-58	\$191,299.64	
	2-0077-61	<u>7,852.23</u>	<u>\$199,151.87</u>

	<u>2-0017-58</u>	<u>2-0077-61</u>	<u>TOTAL</u>
Net Operating	\$ 48,582.44	\$ -	\$ 48,582.44
Debt Retirement	16,614.00	891.00	17,505.00
Reserve	4,578.72	298.29	4,877.01
Interest Charged	<u>46,092.21</u>	<u>2,472.19</u>	<u>48,564.40</u>
	<u>\$115,867.37</u>	<u>\$3,661.48</u>	<u>\$119,528.85</u>

RESERVE ACCOUNT

	<u>2-0017-58</u>	<u>2-0077-61</u>	<u>TOTALS</u>
Balance @ Jan. 1, 1969	\$41,110.75	\$3,156.39	\$44,267.14
Deposited by Municipalities	4,578.72	298.29	4,877.01
Interest Earned	<u>2,368.89</u>	<u>186.14</u>	<u>2,555.03</u>
	\$48,058.36	\$3,640.82	\$51,699.18
Less Expenditures	<u>3,501.95</u>	<u>-</u>	<u>3,501.95</u>
Balance @ Dec. 31, 1969	<u>\$44,556.41</u>	<u>\$3,640.82</u>	<u>\$48,197.23</u>



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1965	346.54	\$31,209.58	\$ 90.06	10 cents
1966	363.47	34,306.82	105.39	15 cents
1967	650.11	42,383.25	65.19	9 cents
1968	539.42	43,308.19	80.29	11 cents
1969	477.8	48,582.44	101.68	16 cents

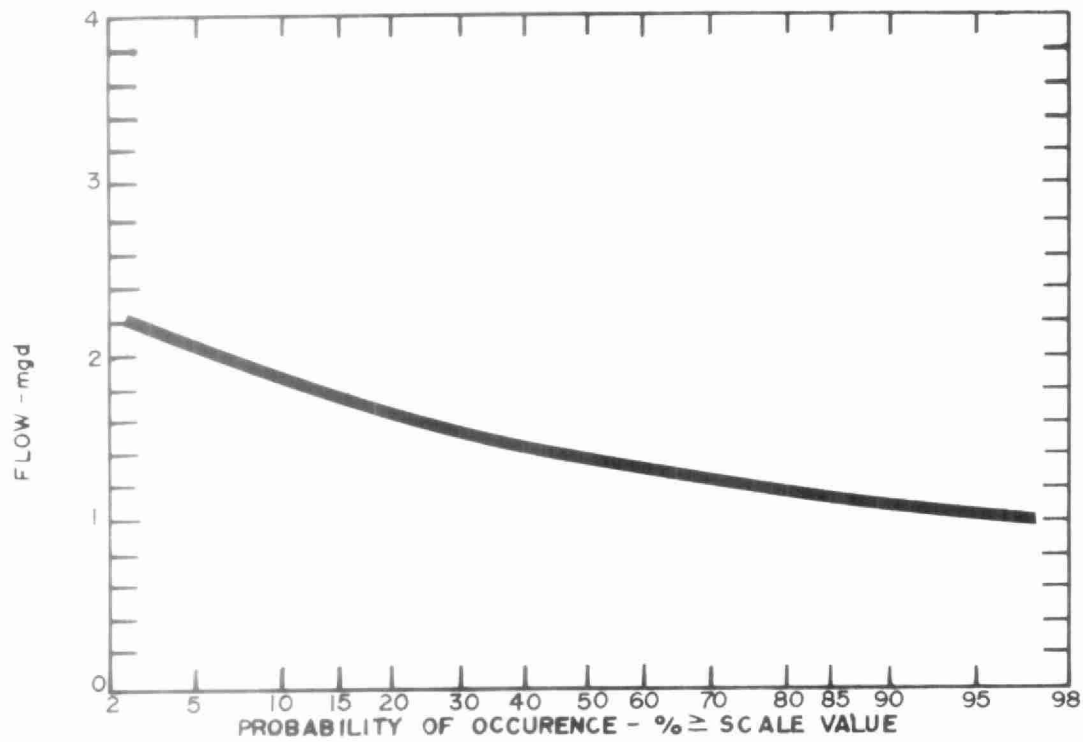
* All projects

Monthly Operating Costs

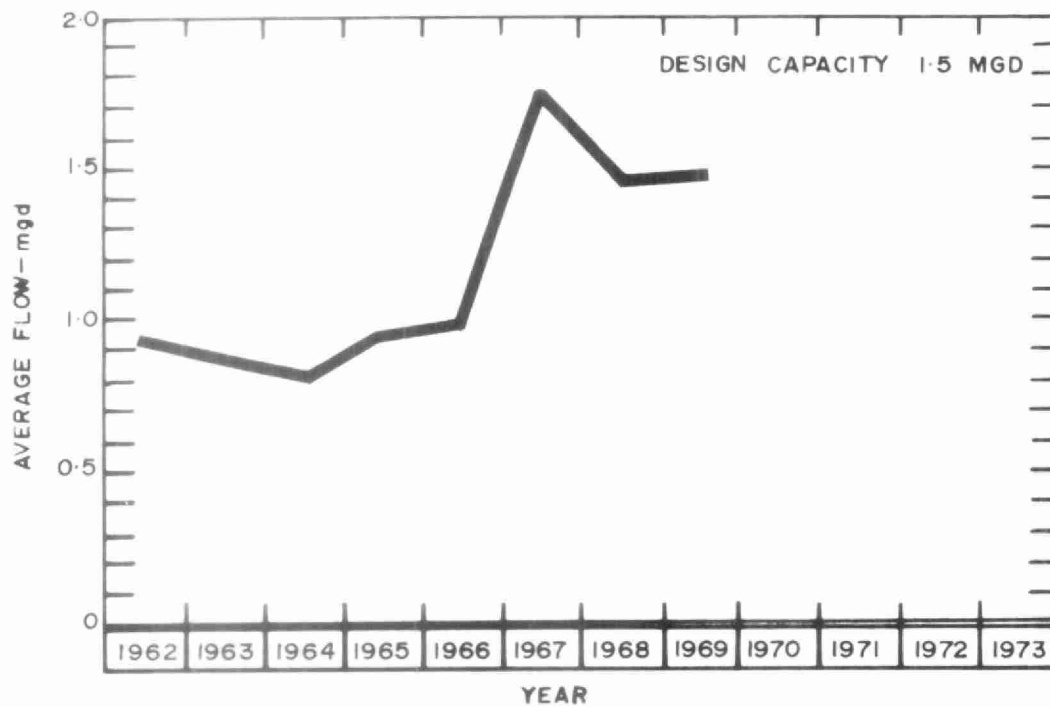
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	2870.03	2402.22	-	35.25	-	238.61	126.70	-	15.00	18.95	-	33.30
FEB	3160.81	1624.93	-	96.48	381.84	238.61	148.25	28.35	52.24	519.76	-	70.35
MAR	4006.65	1624.93	-	128.34	552.68	-	179.30	154.04	107.60	1191.21	-	68.55
APR	2853.47	1792.54	-	45.07	467.22	214.74	106.62	-	67.59	74.19	-	85.50
MAY	3181.81	1901.77	-	65.92	539.29	-	102.01	170.96	236.36	104.90	-	60.60
JUNE	3737.56	1688.95	243.48	23.90	432.08	220.50	129.88	-	418.51	512.01	-	68.25
JULY	5511.50	1688.95	318.41	-	422.65	220.50	46.08	-	211.51	2508.00	-	95.40
AUG	5927.64	2516.42	320.26	-	383.31	220.50	106.14	-	285.80	2043.61	-	51.60
SEPT	3561.78	1702.77	-	-	505.63	220.50	24.71	-	33.81	994.56	-	79.80
OCT	3663.65	1671.24	-	10.92	480.68	220.50	161.36	-	43.20	962.50	-	113.25
NOV	2525.17	1686.58	-	-	418.54	-	107.29	-	185.45	85.01	-	42.30
DEC	7582.37	1713.93	-	128.84	1032.32	220.50	768.05	-	161.91	3243.27	-	313.55
TOTAL	48482.44	22015.23	882.15	534.72	5616.24	2014.96	2006.39	353.35	1818.98	12257.97	-	1082.45

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$10793.65

PROCESS DATA



FL O W S

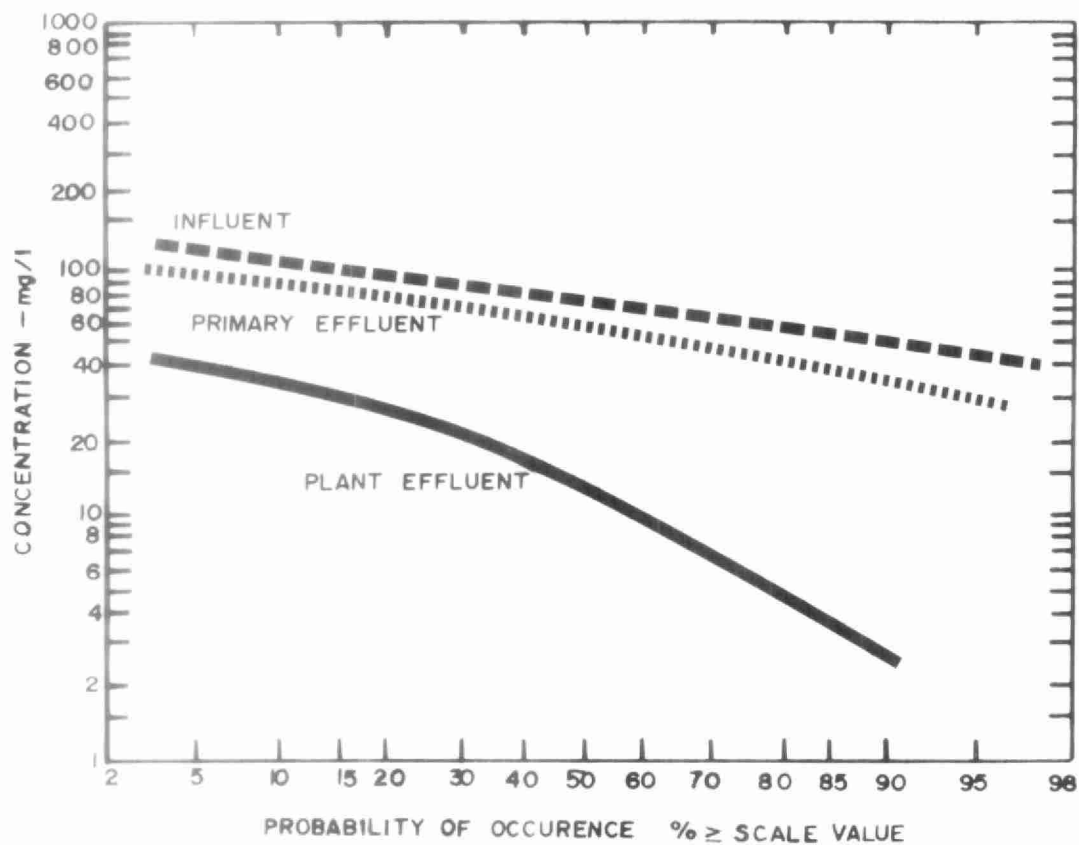


PLANT FLOWS and CHLORINATION

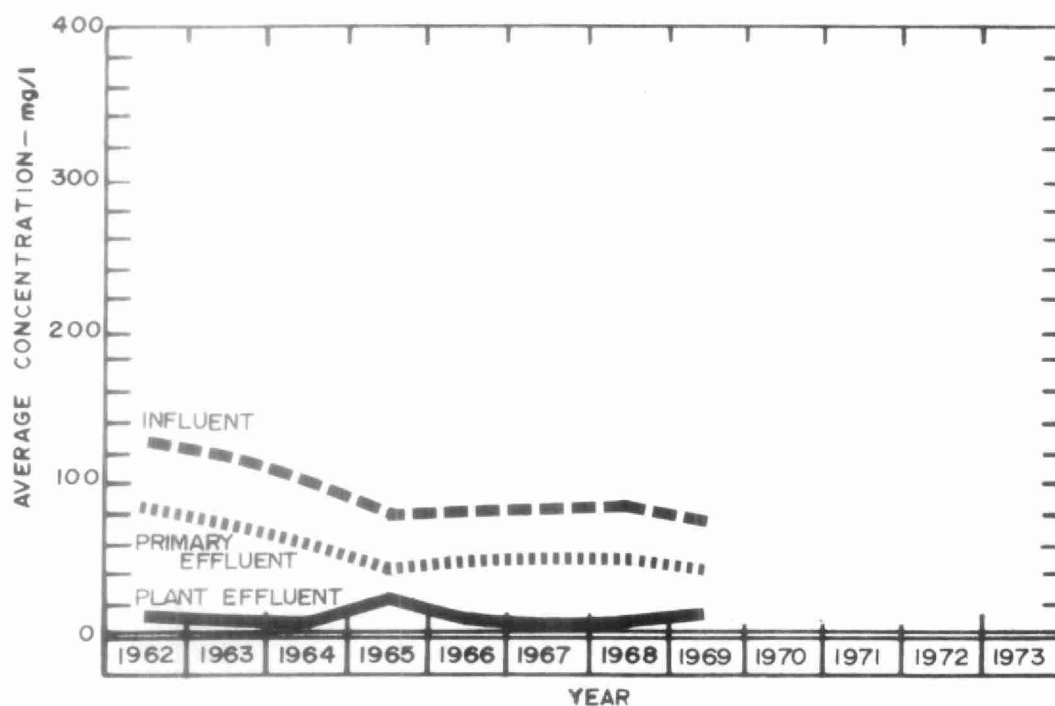
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10 ³ pounds	DOSAGE mg/l
JAN	47.6	1.54	2.39	1.15	1.07	2.2
FEB	40.2	1.43	1.78	1.19	.99	2.5
MAR	53.9	1.74	2.60	1.24	1.03	1.9
APR	55.5	1.85	2.32	1.36	1.04	1.9
MAY	49.8	1.60	2.40	1.28	1.14	2.2
JUNE	39.1	1.30	1.58	.98	1.15	2.9
JULY	40.3	1.30	2.56	.95	1.22	3.0
AUG	48.4	1.56	2.02	1.06	1.14	2.4
SEPT	37.4	1.24	1.47	1.07	1.15	3.1
OCT	35.8	1.16	1.36	.87	.95	2.6
NOV	33.0*	1.11	1.79	1.10	.91	2.7
DEC	46.5**	1.50	1.71	1.32	1.10	2.4
TOTAL	527.5	-	-	-	12.89	-
AVERAGE	-	1.50	-	-	1.07	2.4

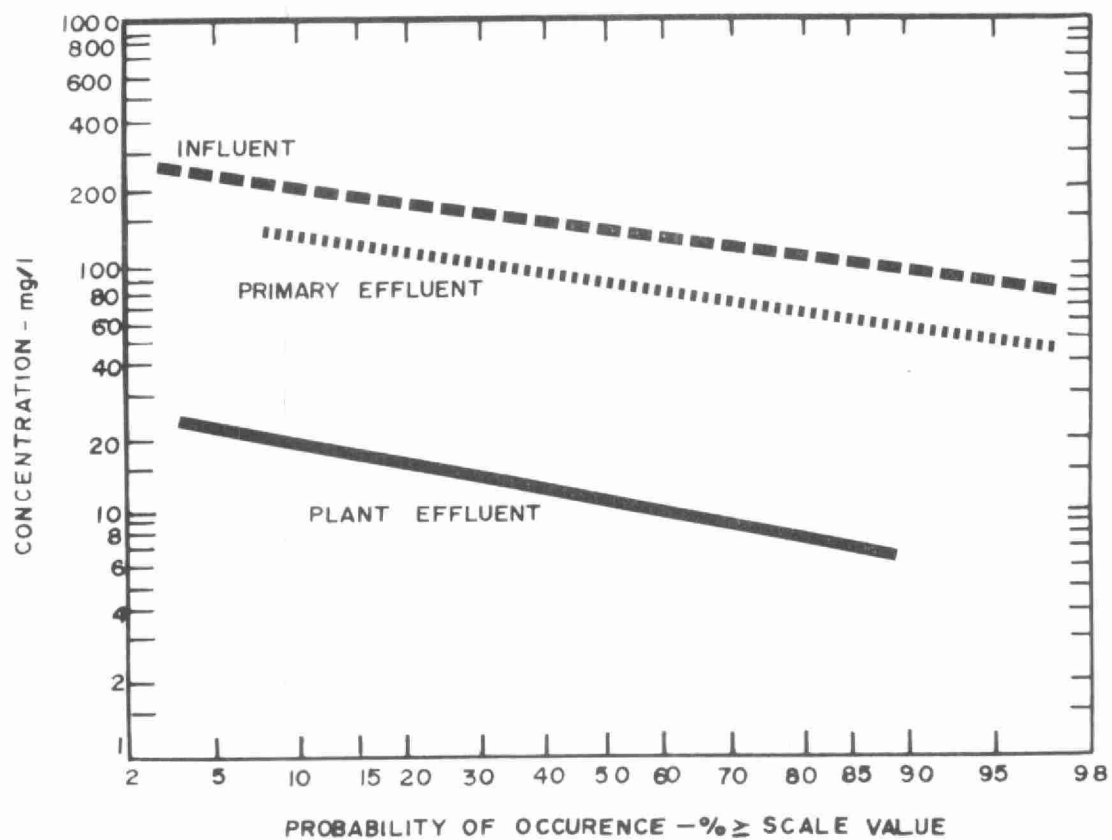
* Prorated on 16 days' data

** Prorated on 21 days' data

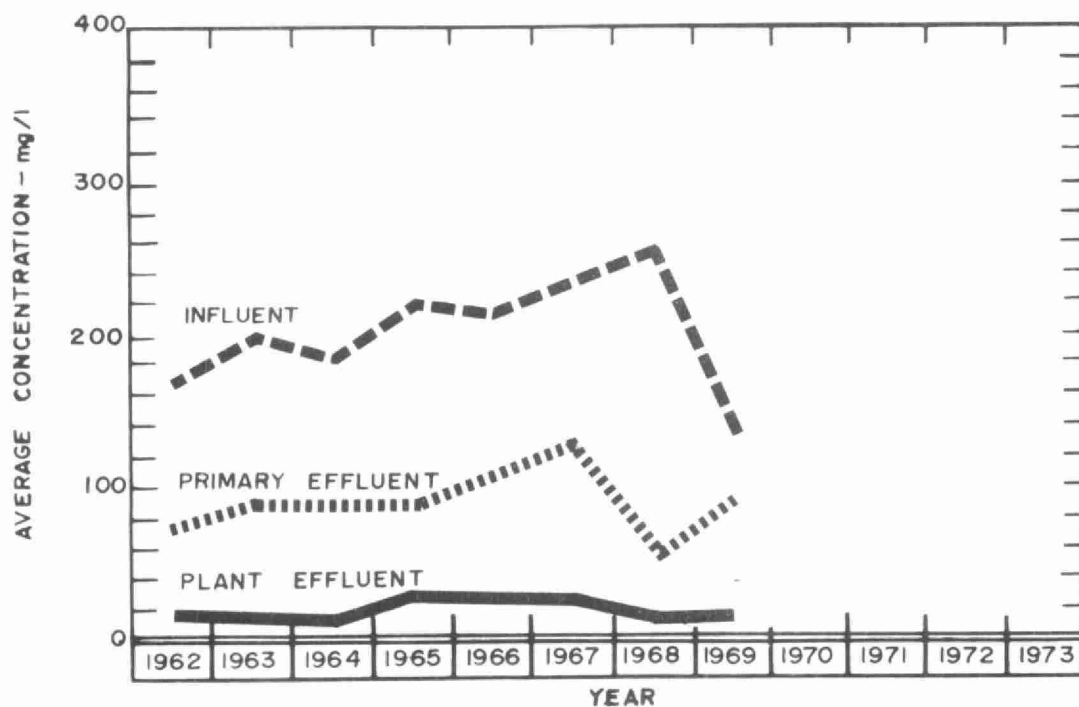


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS

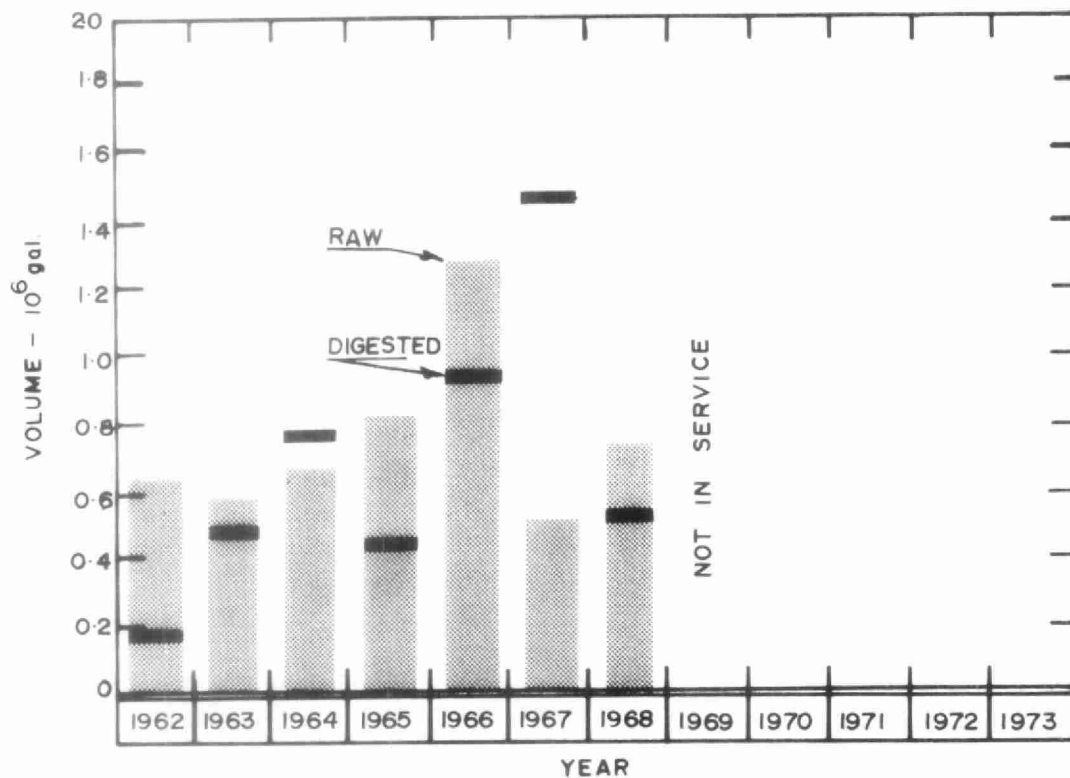


PLANT EFFICIENCY

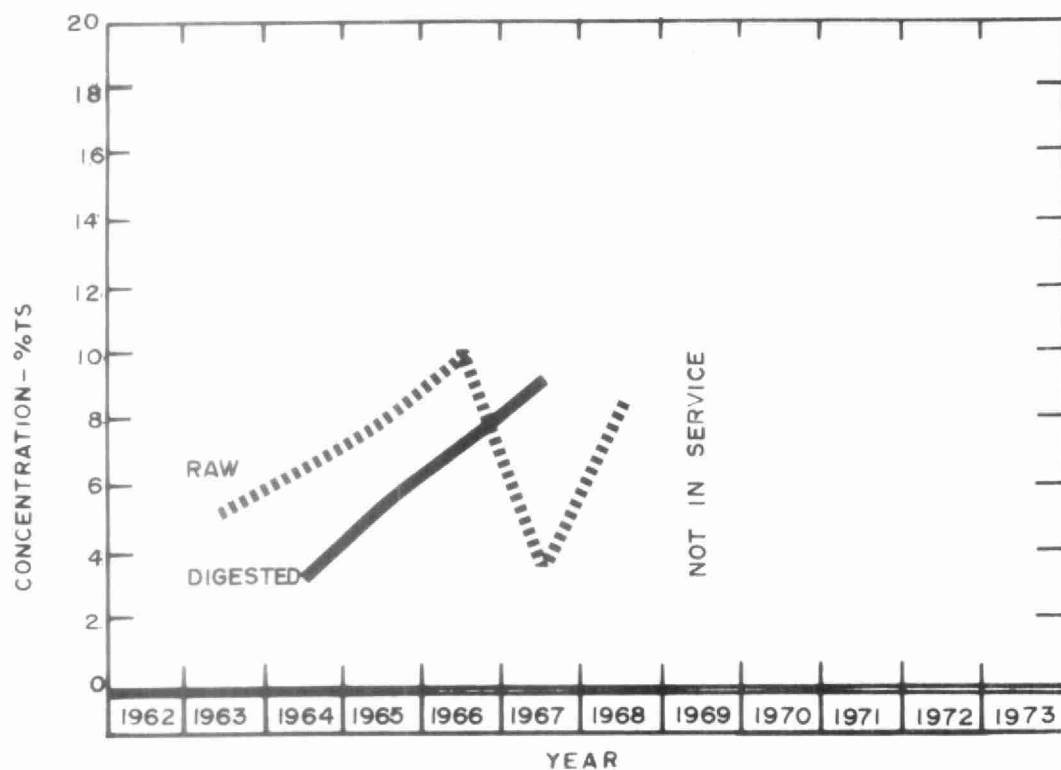
MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT REMOVAL cu ft
	INF. mg/l	EFF. mg/l	REDUCTION		INF. CONCN mg/l	EFF. CONCN mg/l	REDUCTION		
			%	10 ³ pounds			%	10 ³ pounds	
JAN	87	25	71	29.5	125	15	88	52.4	31
FEB	73	7	90	26.5	135	8	94	51.0	15
MAR	81	8	90	39.4	115	10	91	56.6	50
APR	75	17	77	32.2	160	10	94	83.2	18
MAY	88	7	92	40.3	145	10	93	67.2	12
JUNE	72	11	85	23.9	90	8	91	32.1	15
JULY	38	3	92	14.1	65	5	92	24.2	55
AUG	77	3	96	35.8	175	5	97	82.3	50
SEPT	72	22	69	26.1	100	13	87	32.5	29
OCT	95	21	78	26.5	225	10	96	77.0	21
NOV	88	16	82	23.8	176	30	83	48.2	22
DEC	84	38	55	21.4	143	17	88	58.6	22
TOTAL	-	-	-	-	-	-	-	-	340
AVERAGE	78	15	81	28.3	137	12	91	57.1	28

AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg /l	F/M lb BOD lb MLSS
		BOD mg/l	SS CONCN mg/l	BOD mg/l	SS CONCN mg/l		
JAN	1.54	91	160	25	15	1180	.12
FEB	1.43	63	105	7	8	2010	.09
MAR	1.74	52	115	8	10	1910	.09
APR	1.85	70	100	17	10	1940	.12
MAY	1.60	50	70	7	10	1370	.11
JUNE	1.30	56	85	11	8	980	.14
JULY	1.30	36	30	3	5	1030	.09
AUG	1.56	52	55	3	5	1150	.13
SEPT	1.24	40	65	22	13	1130	.15
OCT	1.16	64	75	21	10	1510	.18
NOV	1.11	65	113	16	30	1560	.18
DEC	1.50	51	93	38	17	1320	.11
TOTAL	-	-	-	-	-	-	-
AVERAGE	1.50	58	89	15	12	1420	.14



DIGESTION



SLUDGE DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SLUDGE DISPOSAL	
	VOLUME	TOTAL SOLIDS	VOL SOLIDS	VOLUME	TOTAL SOLIDS	VOL SOLIDS	DEWATERED	LIQUID
	10 gal	%	%	10 ³ gal	%	%	cu yd	cu yd
JAN	-	8.0	45	-	-	-	0	459
FEB	-	10.7	47	-	-	-	0	693
MAR	-	8.7	52	22.2	-	-	0	543
APR	-	10.6	48	14.2	-	-	0	902
MAY	-	7.2	54	-	-	-	0	427
JUNE	-	7.1	59	-	-	-	0	934
JULY	-	7.9	50	-	-	-	0	1679
AUG	-	7.2	52	-	-	-	0	949
SEPT	-	6.5	60	-	-	-	0	903
OCT	-	6.0	62	-	-	-	0	980
NOV	-	6.2	59	-	-	-	0	770
DEC	-	6.3	75	-	-	-	0	742
TOTAL	-	-	-	36.4	-	-	0	9981
AVERAGE	-	7.7	55	-	-	-	0	832

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